

**ASTRONOMY AND GENERAL  
PHYSICS: CONSIDERED WITH  
REFERENCE TO NATURAL  
THEOLOGY**

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Astronomy and General Physics: Considered with Reference to Natural Theology by William Whewell

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**WILLIAM WHEWELL**

**ASTRONOMY AND GENERAL  
PHYSICS: CONSIDERED WITH  
REFERENCE TO NATURAL  
THEOLOGY**



TO THE  
RIGHT HONOURABLE AND RIGHT REVEREND  
CHARLES JAMES,  
LORD BISHOP OF LONDON.

MY LORD—

I owe it to you that I was selected for the task attempted in the following pages, a distinction which I feel to be honourable; and on this account alone I should have a peculiar pleasure in dedicating the work to your lordship. I do so with additional gratification on another account: the Treatise has been written within the walls of the College of which your lordship was formerly a resident member, and its merits, if it have any, are mainly due to the spirit and habits of the place. The society is always pleased and proud to recollect that a person of the eminent talents and high character of your lordship is one of its members; and I am persuaded that any effort in the cause of letters and religion coming from that quarter, will have for you an interest beyond what it would otherwise possess.

The subject proposed to me was limited: my prescribed object is to lead the friends of religion to look with confidence and pleasure on the progress

of the physical sciences, by showing how admirably every advance in our knowledge of the universe harmonizes with the belief of a most wise and good God. To do this effectually, may be, I trust, a useful labour. Yet, I feel most deeply, what I would take this occasion to express, that this, and all that the speculator concerning Natural Theology can do, is utterly insufficient for the great ends of Religion; namely, for the purpose of reforming men's lives, of purifying and elevating their characters, of preparing them for a more exalted state of being. It is the need of something fitted to do this, which gives to religion its vast and incomparable importance; and this can, I well know, be achieved only by that Revealed Religion of which we are ministers, but on which the plan of the present work did not allow me to dwell.

That divine Providence may prosper the labours of your lordship, and of all who are joined with you in the task of maintaining and promoting *this* Religion, is, my lord, the earnest wish and prayer of

Your very faithful  
And much obliged servant,  
WILLIAM WHEWELL.

Trinity College, Cambridge,  
Feb. 25, 1833

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ON  
ASTRONOMY  
AND  
GENERAL PHYSICS.

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INTRODUCTION.

CHAPTER I.

*Object of the Present Treatise.*

THE examination of the material world brings before us a number of things and relations of things which suggest to most minds the belief of a creating and presiding Intelligence. And this impression, which arises with the most vague and superficial consideration of the objects by which we are surrounded, is, we conceive, confirmed and expanded by a more exact and profound study of external nature. Many works have been written at different times with the view of showing how our knowledge of the elements and their operation, of plants and animals and their construction, may serve to nourish and unfold our idea of a Creator and Governor of the world. But though this is the case, a new work on the same subject may still have its use. Our views of the Creator and Governor of the world, as collected from or combined with our views of the world itself, undergo modifications, as we are led by new discoveries, new generalizations, to regard nature in a new light. The conceptions concerning the Deity, his mode of effecting his purposes, the scheme of his government, which are suggested by one stage of our knowledge of natural objects and operations, may become manifestly imperfect or incongenious, if adhered to and applied at a later period, when our acquaintance with the immediate

causes of natural events has been greatly extended. On this account it may be interesting, after such an advance, to show how the views of the creation, preservation, and government of the universe, which natural science opens to us, harmonize with our belief in a Creator, Governor, and Preserver of the world. To do this with respect to certain departments of Natural Philosophy is the object of the following pages; and the author will deem himself fortunate, if he succeeds in removing any of the difficulties and obscurities which prevail in men's minds from the want of a clear mutual understanding between the religious and the scientific speculator. It is needless here to remark the necessarily imperfect and scanty character of Natural Religion; for most persons will allow that, however imperfect may be the knowledge of a Supreme Intelligence which we gather from the contemplation of the natural world, it is still of most essential use and value. And our purpose on this occasion is, not to show that Natural Theology is a perfect and satisfactory scheme, but to bring up our Natural Theology to the point of view in which it may be contemplated by the aid of our Natural Philosophy.

Now the peculiar point of view which at present belongs to Natural Philosophy, and especially to the departments of it which have been most successfully cultivated, is, that nature, so far as it is an object of scientific research, is a collection of facts governed by laws; our knowledge of nature is our knowledge of laws; of laws of operation and connexion, of laws of succession and co-existence, among the various elements and appearances around us. And it must therefore here be our aim to show how this view of the universe falls in with our conception of the Divine Author, by whom we hold the universe to be made and governed.

*Nature acts by general laws; that is, the occurrences of the world in which we find ourselves, result from causes which operate according to fixed and constant rules. The succession of days, and seasons, and years, is produced by the motions of the earth; and these again are governed by the attraction of the sun, a force which acts with unvarying steadiness and regularity. The changes of winds and skies, seemingly so capricious and casual, are produced*

by the operation of the sun's heat upon air and moisture, land and sea; and though in this case we cannot trace the particular events to their general causes, as we can trace the motions of the sun and moon, no philosophical mind will doubt the generality and fixity of the rules by which these causes act. The variety of the effects takes place, because the circumstances in different cases vary; and not because the action of material causes leaves anything to chance in the result. And again, though the vital movements which go on in the frame of vegetables and animals depend on agencies still less known, and probably still more complex, than those which rule the weather, each of the powers on which such movements depend has its peculiar laws of action, and these are as universal and as invariable as the law by which a stone falls to the earth when not supported.

The world then is governed by general laws; and in order to collect from the world itself a judgment concerning the nature and character of its government, we must consider the import and tendency of such laws, so far as they come under our knowledge. If there be, in the administration of the universe, intelligence and benevolence, superintendence and foresight, grounds for love and hope, such qualities may be expected to appear in the constitution and combination of those fundamental regulations by which the course of nature is brought about, and made to be what it is.

If a man were, by some extraordinary event, to find himself in a remote and unknown country, so entirely strange to him that he did not know whether there existed in it any law or government at all; he might in no long time ascertain whether the inhabitants were controlled by any superintending authority; and with a little attention he might determine also whether such authority were exercised with a prudent care for the happiness and well-being of its subjects, or without any regard and fitness to such ends; whether the country were governed by laws at all, and whether the laws were good. And according to the laws which he thus found prevailing, he would judge of the sagacity, and the purposes of the legislative power.

By observing the laws of the material universe and their